

## **REMARKS**

By this Preliminary Amendment, the claims of International Application No. PCT/GB99/03116 have been amended to delete multiple dependencies and to conform to U.S. claim practice. Claims 21 - 27 have been added. Claims 1 - 27 are currently pending.

It is believed that the requested amendments can properly be made at this stage, in that they do not raise new issues, and place the claims in condition for allowance or in better condition for appeal.

### **Disclosure Under 37 CFR § 1.56**

In fulfilling the duty of candor and good faith, the following documents are hereby disclosed to the Patent Office in accordance with 37 CFR § 1.56. It is not admitted that the information in the listed documents is material to patentability as defined in 37 CFR § 1.56(b). The Examiner is requested to consider the documents in the examination of this application.

Accompanying this statement is a Form PTO-1449 in duplicate on which the documents are listed. The Examiner is requested to return an initialed and signed copy of the form once the documents have been considered.

The following documents were cited by the European Patent Office in the International Search Report for International Application No. PCT/GB99/03116 which is a counterpart for this application. The documents were cited in category "A" ("document defining the general state of the art which is not considered to be of particular relevance"). A copy of the International Search Report is attached.

### **U.S. PATENT DOCUMENTS**

<u>Document Number</u>	<u>Name</u>	<u>Category</u>
3,269,862	Lanza et al.	A

3,650,827	Brown et al.	A
5,589,028	Robinson et al.	A

#### FOREIGN PATENT DOCUMENTS

<u>Country</u>	<u>Document Number</u>	<u>Author</u>	<u>Category</u>
Europe	0 528 611 A1	Champlain Cable Corporation	A

In accordance with the notice published in the Official Gazette on November 23, 1993 (1156 OG 91), copies of these documents are not being submitted as Applicant believes that copies have been made available to the Examiner for the national stage application. If this is incorrect, Applicant will readily supply copies. These documents are, however, listed on the accompanying Form PTO-1449.

The following documents were cited by the British Patent Office in the Search Report for British Application No. GB 9820214.6, which is a counterpart for this application. The documents were cited in categories "X" ("document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone"), "Y" ("document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art"). A copy of the British Search Report is attached.

# FOREIGN PATENT DOCUMENTS

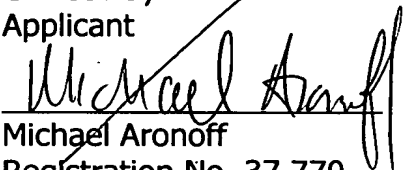
<u>Country</u>	<u>Document Number</u>	<u>Author</u>	<u>Category</u>
GB	1117118	V. L. Lanza et al.	X, Y
JP	6009844	Nissei Denki KK	Y
JP	4329213	Hitachi Cable Ltd.	Y
JP	4329212	Hitachi Cable Ltd.	Y
JP	4206404	Hitachi Cable Ltd.	Y

If the examiner has any questions regarding the presently pending claims which could be easily resolved by a telephone conference, the examiner is respectfully requested to contact the Applicant's representative at the below listed number.

Respectfully submitted,

G. Rodway  
Applicant

By:

  
Michael Aronoff  
Registration No. 37,770  
Attorney for Applicants  
Phone: (650) 361-5979  
Facsimile: (650) 361-5623

## **Versi n with Markings t Sh w Changes**

### In the claims:

Claims 1 - 17, 19, and 20 have been **amended** as follows:

1. (Amended) An electrical wire or cable having insulation comprising  
(i) at least a first layer of a polyolefin-based material comprising at least 20%, by weight (of the whole material composition) of a carbonyl-containing polymer (homopolymer or copolymer or terpolymer), of which the polymer ~~the~~ or at least one constituent monomer is a carboxylic acid ester, preferably an acrylate or acetate, especially an alkyl acrylate (e.g. methyl acrylate, ethyl acrylate, propyl acrylate or butyl acrylate), the ~~said~~ monomer itself constituting at least 5% by weight of the copolymer ~~said co~~, or ~~ter~~ terpolymer when used and the remainder of the copolymer ~~said co~~, or ~~ter~~ terpolymer preferably being derived from olefinic monomer, preferably ethylene;

in contact with

(ii) at least a second layer of a material containing at least 10%, by weight based on the whole material composition, of polyvinylidene fluoride (PVDF), or of a copolymer based on VDF with a partially or fully fluorinated co-monomer;

wherein the at least first layer and the at least second layer, while ~~said~~ layers ~~(i) and (ii) whilst~~ in contact with each other have been subjected to cross-linking reaction sufficient to increase the peel bond strength between the ~~said~~ layers to at least 5N.

2. (Amended) -An electrical wire or cable having insulation comprising  
(i) at least a first layer of a polyolefin-based formulation, of which at least 20%, preferably at least 40%, more preferably at least 60% or very preferably at least 80% of the weight of the polymeric portion of the ~~said~~ formulation consists of a carbonyl-containing polymer (homopolymer or copolymer or terpolymer), of which the polymer ~~the~~ or at least one

constituent monomer is a carboxylic acid ester, preferably an acrylate or acetate, especially an alkyl acrylate (preferably methyl acrylate, ethyl acrylate, propyl acrylate or butyl acrylate), the said monomer itself constituting at least 5%, preferably at least 9%, more preferably at least 15% by weight of the copolymer ~~said co-, or ter-terpolymer~~ when used, and the remainder or the majority of the remainder of the copolymer ~~said co-, or ter-terpolymer~~ preferably being derived from olefinic monomer, preferably ethylene;

in contact with

(ii) at least a second layer of another material formulation, containing at least 10%, more preferably at least 50%, very preferably at least 90%, especially 100%, by weight of the second layer, of polyvinylidene fluoride (PVDF), or especially preferably a copolymer based on VDF with a partially or fully fluorinated co-monomer, most preferably a copolymer of VDF and hexafluoropropylene (HFP);

wherein the at least first layer and the at least second layer, while ~~said layers (i) and (ii) whilst~~ in contact with each other have been subjected to cross-linking reaction, preferably by radiation, more preferably ionising radiation, sufficient to prevent delamination of the two layers during a 1hour acetone immersion test at 23°C, or to increase the peel bond strength between the said layers to at least 5N according to the ASTM B1876-95 method described below preferably increasing the bond strength by at least 50%, more preferably by at least 100%, especially by at least 500% or 1000%, compared to that between the uncrosslinked layers.

3. (Amended) A wire or cable according to claim 1, wherein the ~~said layers (i) and (ii) whilst in contact with each other have been subjected to cross-linking reaction~~ is, preferably by radiation, more preferably ionizing radiation, sufficient to prevent delamination of the two layers during a 1-hour acetone immersion test at 23°C.

4. (Amended) -A wire or cable according to ~~any preceding claim 3~~, wherein the cross-linking reaction has increased the bond strength by at least 50%, preferably by at least 100%, especially by at least 500% or 1000%, compared to that between the uncrosslinked layers.

5. (Amended) -A wire or cable according to ~~any preceding claim 4~~, wherein the respective layers have been brought into contact with each other prior to cross-linking of either layer and at a temperature above the melting or softening point of the polymeric material in at least one of the layers.

6. (Amended) -A wire or cable according to ~~any preceding claim 5~~, wherein the polyvinylidene fluoride-based layer comprises a copolymer of VDF and hexafluoropropylene (HFP), ~~thet~~that copolymer constituting a majority by weight, preferably substantially all, of the material in that layer.

7. (Amended) -A wire or cable according to ~~any preceding claim 5~~, wherein the polyvinylidene fluoride-based layer comprises a copolymer of VDF and hexafluoropropylene (HFP), preferably of HFP content 8-12wt%, very preferably 9-11wt%.

8. (Amended) -A wire or cable according to ~~any preceding claim 1~~, wherein the polyolefin-based layer comprises a mixture of polyethylene and the ~~said~~ carbonyl-containing polymer.

9. (Amended) -A wire or cable according to ~~any preceding claim 1~~, comprising an inner layer of the ~~said~~ polyolefin-based material and an outer layer of the ~~said~~ polyvinylidene fluoride-based material.

10. (Amended) -A wire or cable according to claim 9, wherein the ~~said~~ outer layer has been pressure-extruded onto the ~~said~~ inner layer.

11. (Amended) -A wire or cable according to ~~any preceding claim 1~~, wherein the cross-linking reaction has been effected by radiation, preferably ionizing radiation.

12. (Amended) -A wire or cable according to ~~any preceding claim 1~~, comprising multiple alternating layers of the materials constituting the said layers (i) and (ii).

13. (Amended) A wire or cable according to ~~any preceding claim 1~~, which contains at least one crosslinking promoter in the material of either or both of the ~~said~~ layers (i) and (ii), the cross-linking promoter preferably having been added only to the material of the ~~said~~ layer (i).

14. (Amended) -A wire or cable according to ~~any preceding claim 1~~, which contains at least one crosslinking promoter in the material of either or both of the ~~said~~ layers (i) and (ii), wherein the crosslinking promoter is a multifunctional acrylate or methacrylate ester, preferably trimethylolpropanetrimethacrylate (TMPTM).

15. (Amended) -A wire or cable according to claim 14, wherein the cross-linking promoter has been added only to the material of the ~~said~~ layer (i).

16. (Amended) -A wire or cable according to ~~any of the preceding claims 1~~, wherein the polyvinylidene-based layer (ii) is substantially transparent, preferably containing substantially only PVDF or the ~~said~~ VDF co-polymer.

17. (Amended) -A method of making a wire or cable according to ~~any of the preceding claims 1~~, comprising the steps of providing on an electrical conductor the ~~said~~ layers (i) and (ii) in contact with each other, and subjecting the ~~said~~ layers while in contact with each other to the ~~said~~ cross-linking reaction.

19. (Amended) -A method according to claim 17-~~or 18~~, wherein layer (i) is pressure extruded onto the conductor and/or layer (ii) is pressure extruded over layer (i).

20. (Amended) -A method according to claim 17,~~18, or 19~~, wherein layers (i) and (ii) are co-extruded or tandem extruded onto the wire in a single pass of the conductor from an extrusion process pay-out device to an extrusion process take-up device.

Claim 21- 27 have been **added** as follows:

21. A wire or cable according to 2, wherein the respective layers have been brought into contact with each other prior to cross-linking of either layer and at a temperature above the melting or softening point of the polymeric material in at least one of the layers.

22. A wire or cable according to claim 21, wherein the polyvinylidene fluoride-based layer comprises a copolymer of VDF and hexafluoropropylene (HFP), the copolymer constituting a majority by weight, preferably substantially all, of the material in that layer.

23. A wire or cable according to claim 21, wherein the polyvinylidene fluoride-based layer comprises a copolymer of VDF and hexafluoropropylene (HFP), preferably of HFP content 8-12wt%, very preferably 9-11wt%.

24. A wire or cable according to claim 2, wherein the polyolefin-based layer comprises a mixture of polyethylene and the carbonyl-containing polymer.

25. A wire or cable according to claim 2, comprising an inner layer of the polyolefin-based material and an outer layer of the polyvinylidene fluoride-based material.



26. A wire or cable according to claim 25, wherein the outer layer has been pressure-extruded onto the inner layer.

27. A wire or cable according to claim 2, comprising multiple alternating layers of the materials constituting the layers (i) and (ii).